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TITLE: POLAR COLUMN OR LEAD-ACID BATTERY AND MANUFACTURE THEREOF

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ABSTRACT:

PURPOSE: To improve the current-carrying performance of a polar column for a lead-acid battery by providing a tin-plating layer through a lead-plating layer in the surface of a bolt or a nut to improve adhesion between the polar column main body and the bolt or the nut.

CONSTITUTION: In a polar column for a lead-acid battery, a tin-plating layer 3 is provided through a lead-plating layer 2 in the surface of a nut 1 containing copper as a main component. The base body of the nut 1 with the lead-plating layer 2 and the tin-plating layer 3 has the structure of being cast into a polar column main body containing lead as a main component. The nut I has a buried base part 1a at the base end and the tin-plating layer 3 is applied to the surface of the buried base part 1a through the lead-plating layer 2. The length cast into the polar column main body becomes long, so that the mechanical coupling strength and the current-carrying performance between the bolt or the nut and the polar column main body 4 are remarkably improved.

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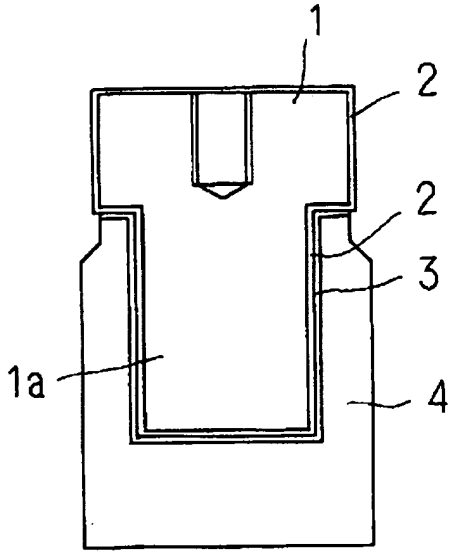
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(54)【発明の名称】　鉛蓄電池用極柱及びその製造方法

(57)【要約】
【目的】　ボルト若しくはナットと極柱本体との密着性を向上させることができる鉛蓄電池用極柱を提供する。
【構成】　銅を主成分としたボルト若しくはナット１の表面に鉛メッキ層２を介して錫メッキ層３を設け、このように鉛メッキ層２及び錫メッキ層３を設けたボルト若しくはナット１の基部を、鉛を主成分とする極柱本体４に鋳込む。



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【特許請求の範囲】

【請求項1】　銅を主成分としたボルト若しくはナットの基部が、鉛を主成分とする極柱本体に鋳込まれている鉛蓄電池用極柱において、
前記ボルト若しくはナットの表面に鉛メッキ層を介して錫メッキ層が施されていることを特徴とする鉛蓄電池用極柱。

【請求項2】　銅を主成分としたボルト若しくはナットの基部が、鉛を主成分とする極柱本体に鋳込まれている鉛蓄電池用極柱において、
前記ボルト若しくはナットの表面に鉛メッキ層を介して錫メッキ層が施され、前記鉛メッキ層と前記錫メッキ層との間及び前記錫メッキ層と前記極柱本体との間に共晶合金Ｐｂ－Ｓｎ層がそれぞれ介在されていることを特徴とする鉛蓄電池用極柱。

【請求項3】　鉛メッキ層を施したボルト若しくはナットを溶融錫中に浸漬して前記鉛メッキ層の表面に錫メッキ層を設け、得られた鉛メッキ層及び錫メッキ層付のボルト若しくはナットの基部を、鉛を主成分とする極柱本体の鋳造時に鋳込んで鉛蓄電池用極柱を得ることを特徴とする鉛蓄電池用極柱の製造方法。

【請求項4】　鉛メッキ層を施したボルト若しくはナットを、鉛の融点以上の温度の溶融錫中に浸漬して前記鉛メッキ層の表面に錫メッキ層を設け、得られた鉛メッキ層及び錫メッキ層付のボルト若しくはナットの基部を、錫の融点以上の温度の溶融鉛を用いて行う極柱本体の鋳造時に鋳込んで鉛蓄電池用極柱を得ることを特徴とする鉛蓄電池用極柱の製造方法。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、鉛蓄電池用極柱及びその製造方法に関するものである。

【０００２】

【従来の技術】鉛蓄電池用極柱においては、接続線の端子をボルト締めで締結するために予め銅を主成分としたボルト若しくはナットの基部を鋳込んでいる。

【０００３】従来、鉛蓄電池用極柱の極柱本体に、基部を鋳込むボルト若しくはナットの表面処理としては、鉛メッキ若しくは半田（Ｐｂ－Ｓｎ）メッキ、若しくは両者の併用がほとんどであった。

【０００４】

【発明が解決しようとする課題】しかしながら、上記の如き従来の表面処理では、鋳造する銅を主成分としたボルト若しくはナットと、鉛を主成分とする極柱本体との密着性は、極柱本体の材質が鉛－アンチモン系合金の場合はよいが、極柱本体の材質が鉛－Ｃａ系合金の場合は酸化膜の影響で密着性が皆無であった。

【０００５】本発明の目的は、ボルト若しくはナットと極柱本体との密着性を向上させることができる鉛蓄電池用極柱を提供することにある。

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【０００６】本発明の目的は、簡単な表面処理でボルト若しくはナットと極柱本体との密着性を向上させることができる鉛蓄電池用極柱の製造方法を提供することにある。

【０００７】

【課題を解決するための手段】上記の目的を達成する本発明の手段を説明すると、次の通りである。

【０００８】本発明は、銅を主成分としたボルト若しくはナットの基部が、鉛を主成分とする極柱本体に鋳込まれている構造の鉛蓄電池用極柱を発明の対象としている。

【０００９】本発明では、前記ボルト若しくはナットの表面に鉛メッキ層を介して錫メッキ層が施されていることを特徴とする。

【００１０】また本発明では、前記ボルト若しくはナットの表面に鉛メッキ層を介して錫メッキ層が施され、前記鉛メッキ層と前記錫メッキ層との間及び前記錫メッキ層と前記極柱本体との間に共晶合金Ｐｂ－Ｓｎ層がそれぞれ介在されていることを特徴とする。

【００１１】本発明は、銅を主成分としたボルト若しくはナットの基部が、鉛を主成分とする極柱本体に鋳込まれている構造の鉛蓄電池用極柱の製造方法を発明の対象としている。

【００１２】本発明では、鉛メッキ層を施したボルト若しくはナットを溶融錫中に浸漬して前記鉛メッキ層の表面に錫メッキ層を設け、得られた鉛メッキ層及び錫メッキ層付のボルト若しくはナットの基部を、鉛を主成分とする極柱本体の鋳造時に鋳込んで鉛蓄電池用極柱を得ることを特徴とする。

【００１３】また本発明では、鉛メッキ層を施したボルト若しくはナットを、鉛の融点以上の温度の溶融錫中に浸漬して前記鉛メッキ層の表面に錫メッキ層を設け、得られた鉛メッキ層及び錫メッキ層付のボルト若しくはナットの基部を、錫の融点以上の温度の溶融鉛を用いて行う極柱本体の鋳造時に鋳込んで鉛蓄電池用極柱を得ることを特徴とする。

【００１４】各発明においては、ボルト若しくはナットの基端に埋め込み基部を設けておき、この埋め込み基部の表面にも鉛メッキ層を介して錫メッキ層を設けることが好ましい。

【００１５】

【作用】ボルト若しくはナットの表面に鉛メッキ層を介して錫メッキ層を設けると、ボルト若しくはナットと極柱本体との密着性が向上する。また、このようにボルト若しくはナットと極柱本体との密着性を向上させると、鉛蓄電池用極柱の通電性能を向上させることができる。

【００１６】また、ボルト若しくはナットの表面に鉛メッキ層を介して錫メッキ層を設け、鉛メッキ層と錫メッキ層との間及び錫メッキ層と極柱本体との間に共晶合金Ｐｂ－Ｓｎ層をそれぞれ介在させると、該共晶合金Ｐｂ

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－Ｓｎ層の存在により、鉛メッキ層と錫メッキ層との間及び錫メッキ層と極柱本体との間の密着性が飛躍的に向上する。また、このようにボルト若しくはナットと極柱本体との密着性を飛躍的に向上させると、鉛蓄電池用極柱の通電性能を飛躍的に向上させることができる。

【００１７】また、鉛メッキ層を施したボルト若しくはナットを溶融錫中に浸漬して鉛メッキ層の表面に錫メッキ層を設け、得られた鉛メッキ層及び錫メッキ層付のボルト若しくはナットの基部を、鉛を主成分とする極柱本体の鋳造時に鋳込んで鉛蓄電池用極柱を製造すると、錫メッキ層を設けるという簡単で安価な表面処理でボルト若しくはナットと極柱本体との密着性を向上させることができる。これに伴い、鉛蓄電池用極柱の通電性能を向上させることができる。

【００１８】また、鉛メッキ層を施したボルト若しくはナットを、鉛の融点以上の温度の溶融錫中に浸漬して鉛メッキ層の表面に錫メッキ層を設け、得られた鉛メッキ層及び錫メッキ層付のボルト若しくはナットの基部を、錫の融点以上の温度の溶融鉛を用いて行う極柱本体の鋳造時に鋳込んで鉛蓄電池用極柱を製造すると、錫メッキ層を設けるという簡単で安価な表面処理とそのときの温度管理及び極柱本体の鋳造時の温度管理により、鉛メッキ層と錫メッキ層との間及び錫メッキ層と極柱本体との間の密着性を飛躍的に向上させることができる。これに伴い、鉛蓄電池用極柱の通電性能を飛躍的に向上させることができる。

【００１９】各発明においては、ボルト若しくはナットの基端に埋め込み基部を設けておき、この埋め込み基部の表面にも鉛メッキ層を介して錫メッキ層を設けておくと、極柱本体に鋳込まれる長さが長くなり、ボルト若しくはナットと極柱本体との機械的結合強度及び通電性能が著しく向上する。

【００２０】

【実施例】図１は本発明に係る鉛蓄電池用極柱の一実施例を示したものである。本実施例の鉛蓄電池用極柱は、銅を主成分としたナット１の表面に鉛メッキ層２を介して錫メッキ層３が施され、このような鉛メッキ層２及び錫メッキ層３付のナット１の基部が鉛を主成分とする極柱本体４に鋳込まれた構造になってる。ナット１はその基端に埋め込み基部１ａを有し、該埋め込み基部１ａの表面にも鉛メッキ層２を介して錫メッキ層３が施されている。

【００２１】上記実施例では、ナット１を鋳込んだ鉛蓄電池用極柱について示したが、銅を主成分としたボルトを鋳込んだ鉛蓄電池用極柱にも、同様に適用することができる。この場合も、ボルトの基端には埋め込み基部が設けられ、このような埋め込み基部付のボルトの表面に鉛メッキ層を介して錫メッキ層が施されてる。

【００２２】次に、このような鉛蓄電池用極柱の製造方法について説明する。

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【００２３】銅を主成分としたボルト若しくはナット１の表面に電着による鉛メッキ（10～30μｍ）で鉛メッキ層２を設ける。次に、鉛メッキ層２を設けたボルト若しくはナット１を、鉛の融点（327 ℃）以上の温度である380 ℃±１０に溶融した錫に５～10秒間浸漬することによって錫メッキ層３を設ける。得られた鉛メッキ層２及び錫メッキ層３付のボルト若しくはナット１の基部を、錫の融点（230 ℃）以上の温度の溶融鉛を用いて行う極柱本体４の鋳造時に鋳込んで鉛蓄電池用極柱を得る。

【００２４】図２は、図１に示した鉛蓄電池用極柱の合金組成図を示したものである。図示のように鉛メッキ層２と錫メッキ層３との間には共晶合金Ｐｂ－Ｓｎ層５が介在され、錫メッキ層３と極柱本体４との間には共晶合金Ｐｂ－Ｓｎ層６が介在されている。

【００２５】この場合、共晶合金Ｐｂ－Ｓｎ層５は、錫メッキ層３を施す際に、錫の温度を鉛の融点（327 ℃）以上に上げた溶融錫に鉛メッキ層２を浸漬した結果できた共晶合金層である。

【００２６】共晶合金Ｐｂ－Ｓｎ層６は、極柱本体４を鋳造する際に、鉛の温度を錫の融点（230 ℃）以上に上げて鋳造した結果できた共晶合金層である。

【００２７】これらこの共晶合金Ｐｂ－Ｓｎ層５，６によって、ボルト若しくはナット１と極柱本体４との密着性が飛躍的に向上し、鉛蓄電池用極柱の通電性能が飛躍的に向上する。

【００２８】特に、図１に示すように、ボルト若しくはナット１の基端に埋め込み基部１ａを設けておき、この埋め込み基部１ａの表面にも鉛メッキ層２を介して錫メッキ層３を設けておくと、極柱本体４に鋳込まれる長さが長くなり、ボルト若しくはナット１と極柱本体４との機械的結合強度及び通電性能が著しく向上する。

【００２９】共晶合金Ｐｂ－Ｓｎ層５，６を有する本発明の鉛蓄電池用極柱におけるボルト若しくはナット１と極柱本体４との密着性と、該鉛蓄電池用極柱の通電性能について、従来構造の鉛蓄電池用極柱との比較試験を行ったところ次のような結果が得られた。

【００３０】（１）密着性の比較試験（対トルク試験）

従来品 900kg・cm→本発明品 2700 kg・cm

このように本発明品は、従来品に比べて対トルク試験値が約３倍向上していることが明らかとなった。

【００３１】この場合、対トルク試験は、図３に示すように、極柱本体４を固定しておいて、ボルト若しくはナット１にトルクレンチ７を嵌め込んで、どの程度のトルクでボルト若しくはナット１が回るかを測定することにより行った。

【００３２】（２）通電性能試験（ 500Aの電流を通電）

従来品 45mV（ｎ＝10）→本発明品 4.0mV （ｎ＝10）

このように本発明品は、従来品に比べて通電性能が約10％向上していることが明らかとなった。

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【0033】

【発明の効果】以上説明したように本発明に係る鉛蓄電池用極柱及びその製造方法によれば、下記のような優れた効果を得ることができる。

【0034】ボルト若しくはナットの表面に鉛メッキ層を介して錫メッキ層を設けているので、ボルト若しくはナットと極柱本体との密着性を向上させることができる。このため、鉛蓄電池用極柱の通電性能を向上させることができる。

【0035】また、ボルト若しくはナットの表面に鉛メッキ層を介して錫メッキ層を設け、鉛メッキ層と錫メッキ層との間及び錫メッキ層と極柱本体との間に共晶合金Ｐｂ－Ｓｎ層をそれぞれ介在させているので、これら共晶合金Ｐｂ－Ｓｎ層の存在により、鉛メッキ層と錫メッキ層との間及び錫メッキ層と極柱本体との間の密着性を飛躍的に向上させることができる。このため、鉛蓄電池用極柱の通電性能を飛躍的に向上させることができる。

【0036】また、鉛メッキ層を施したボルト若しくはナットを溶融錫中に浸漬して前記鉛メッキ層の表面に錫メッキ層を設け、得られた鉛メッキ層及び錫メッキ層付のボルト若しくはナットの基部を、鉛を主成分とする極柱本体の鋳造時に鋳込んで鉛蓄電池用極柱を製造しているので、錫メッキ層を設けるという簡単で安価な表面処理でボルト若しくはナットと極柱本体との密着性を向上させることができる。これに伴い、鉛蓄電池用極柱の通電性能を向上させることができる。

【0037】また、鉛メッキ層を施したボルト若しくはナットを、鉛の融点以上の温度の溶融錫中に浸漬して前記鉛メッキ層の表面に錫メッキ層を設け、得られた鉛メッキ層及び錫メッキ層付のボルト若しくはナットの基部を、錫の融点以上の温度の溶融鉛を用いて行う極柱本体の鋳造時に鋳込んで鉛蓄電池用極柱を製造しているので、錫メッキ層を設けるという簡単で安価な表面処理とそのときの温度管理及び極柱本体の鋳造時の温度管理により、鉛メッキ層と錫メッキ層との間及び錫メッキ層と極柱本体との間の密着性を飛躍的に向上させることができる。これに伴い、鉛蓄電池用極柱の通電性能を飛躍的に向上させることができる。

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【図面の簡単な説明】

【図１】本発明に係る鉛蓄電池用極柱の一実施例の縦断図である。

【図２】図１に示す鉛蓄電池用極柱の金属合金組成図である。

【図３】トルク試験方法の説明図である。

【符号の説明】

１　ナット

１ａ　埋め込み基部

２　鉛メッキ層

３　錫メッキ層

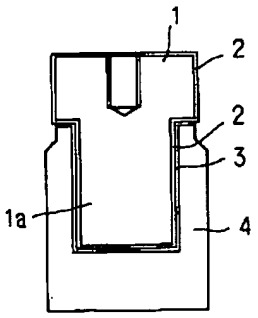
４　極柱本体

５　共晶合金Ｐｂ－Ｓｎ層

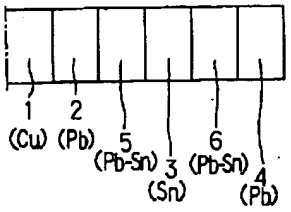
６　共晶合金Ｐｂ－Ｓｎ層

７　トルクレンチ

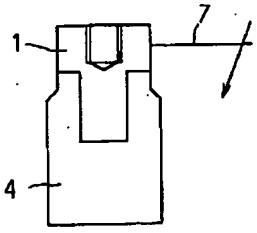
【図１】



【図２】



【図３】



* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
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3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The pole pillar for lead accumulators characterized by giving the tinning layer to the front face of said bolt or a nut through a lead deposit in the pole pillar for lead accumulators currently cast by the pole pillar body with which the base of the bolt which used copper as the principal component, or a nut uses lead as a principal component.
[Claim 2] The pole pillar for lead accumulators characterized by giving a tinning layer to the front face of said bolt or a nut through a lead deposit, and the eutectic alloy Pb-Sn layer intervening in the pole pillar for lead accumulators currently cast by the pole pillar body with which the base of the bolt which used copper as the principal component, or a nut uses lead as a principal component, respectively between said lead deposits and said tinning layers and between said tinning layers and said pole pillar bodies.
[Claim 3] The manufacture approach of the pole pillar for lead accumulators characterized by immersing the bolt or nut which gave the lead deposit into melting tin, preparing a tinning layer in the front face of said lead deposit, casting a bolt the obtained lead deposit and with a tinning layer, or the base of a nut at the time of casting of the pole pillar body which uses lead as a principal component, and obtaining the pole pillar for lead accumulators.
[Claim 4] The manufacture approach of the pole pillar for lead accumulators characterized by to cast at the time of casting of the pole pillar body which is immersed into the melting tin of the temperature more than the leaden melting point in the bolt or nut which gave the lead deposit, prepares a tinning layer in the front face of said lead deposit, and performs a bolt the obtained lead deposit and with a tinning layer, or the base of a nut using the molten lead of the temperature more than the melting point of tin, and to obtain the pole pillar for lead accumulators.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the pole pillar for lead accumulators, and its manufacture approach.
[0002]
[Description of the Prior Art] In the pole pillar for lead accumulators, in order to conclude the terminal of a path cord by bolting, the base of the bolt which used copper as the principal component beforehand, or a nut is cast.
[0003] Conventionally, as surface treatment of the bolt which casts a base on the pole pillar body of the pole pillar for lead accumulators, or a nut, lead plating, solder (Pb-Sn) plating, or both concomitant use was almost the case.
[0004]
[Problem(s) to be Solved by the Invention] However, when the quality of the material of a pole pillar body was a lead-antimony system alloy, it was good, but the adhesion of the bolt or nut which used the copper to cast as the principal component in the conventional surface preparation like the above, and the pole pillar body which uses lead as a principal component had no adhesion under the effect of an oxide film, when the quality of the material of a pole pillar body was a lead-calcium system alloy.
[0005] The purpose of this invention is to offer the pole pillar for lead accumulators which can raise the adhesion of a bolt or a nut, and a pole pillar body.
[0006] The purpose of this invention is to offer the manufacture approach of the pole pillar for lead accumulators which can raise the adhesion of a bolt or a nut, and a pole pillar body by easy surface preparation.
[0007]
[Means for Solving the Problem] It is as follows when a means of this invention to attain the above-mentioned purpose is explained.
[0008] The base of the bolt which used copper as the principal component, or a nut makes this invention the object of invention of the pole pillar for lead accumulators of the structure currently cast by the pole pillar body which uses lead as a principal component.
[0009] In this invention, it is characterized by giving the tinning layer to the front face of said bolt or a nut through a lead deposit.
[0010] Moreover, in this invention, a tinning layer is given to the front face of said bolt or a nut through a lead deposit, and it is characterized by the eutectic alloy Pb-Sn layer intervening, respectively between said lead deposits and said tinning layers and between said tinning layers and said pole pillar bodies.
[0011] The base of the bolt which used copper as the principal component, or a nut makes this invention the object of invention of the manufacture approach of the pole pillar for lead accumulators of the structure currently cast by the pole pillar body which uses lead as a principal component.
[0012] In this invention, it is characterized by immersing the bolt or nut which gave the lead deposit into melting tin, preparing a tinning layer in the front face of said lead deposit, casting a bolt the obtained

lead deposit and with a tinning layer, or the base of a nut at the time of casting of the pole pillar body which uses lead as a principal component, and obtaining the pole pillar for lead accumulators.
[0013] Moreover, in this invention, it is characterized by casting at the time of casting of the pole pillar body which is immersed into the melting tin of the temperature more than the leaden melting point in the bolt or nut which gave the lead deposit, prepares a tinning layer in the front face of said lead deposit, and performs a bolt the obtained lead deposit and with a tinning layer, or the base of a nut using the molten lead of the temperature more than the melting point of tin, and obtaining the pole pillar for lead accumulators.
[0014] In each invention, it is desirable to embed at the end face of a bolt or a nut, to prepare the base, and to prepare a tinning layer also in the front face of this embedding base through a lead deposit.
[0015]
[Function] If a tinning layer is prepared in the front face of a bolt or a nut through a lead deposit, the adhesion of a bolt or a nut, and a pole pillar body will improve. Moreover, if the adhesion of a bolt or a nut, and a pole pillar body is raised in this way, the energization engine performance of the pole pillar for lead accumulators can be raised.
[0016] Moreover, if a tinning layer is prepared in the front face of a bolt or a nut through a lead deposit and an eutectic alloy Pb-Sn layer is made to intervene, respectively between a lead deposit and a tinning layer and between a tinning layer and a pole pillar body, the adhesion between a lead deposit and a tinning layer and between a tinning layer and a pole pillar body will improve by leaps and bounds by existence of this eutectic alloy Pb-Sn layer. Moreover, if the adhesion of a bolt or a nut, and a pole pillar body is raised by leaps and bounds in this way, the energization engine performance of the pole pillar for lead accumulators can be raised by leaps and bounds.
[0017] Moreover, if the bolt or nut which gave the lead deposit is immersed into melting tin, a tinning layer is prepared in the front face of a lead deposit, a bolt the obtained lead deposit and with a tinning layer or the base of a nut is cast at the time of casting of the pole pillar body which uses lead as a principal component and the pole pillar for lead accumulators is manufactured, the adhesion of a bolt or a nut, and a pole pillar body can be raised by the easy and cheap surface preparation of preparing a tinning layer. In connection with this, the energization engine performance of the pole pillar for lead accumulators can be raised.
[0018] Moreover, the bolt or nut which gave the lead deposit is immersed into the melting tin of the temperature more than the leaden melting point, and a tinning layer is prepared in the front face of a lead deposit. If it casts at the time of casting of the pole pillar body which performs a bolt the obtained lead deposit and with a tinning layer, or the base of a nut using the molten lead of the temperature more than the melting point of tin and the pole pillar for lead accumulators is manufactured By the easy and cheap surface treatment of preparing a tinning layer, the temperature management at that time, and temperature management at the time of casting of a pole pillar body, the adhesion between a lead deposit and a tinning layer and between a tinning layer and a pole pillar body can be raised by leaps and bounds. In connection with this, the energization engine performance of the pole pillar for lead accumulators can be raised by leaps and bounds.
[0019] In each invention, if it embeds at the end face of a bolt or a nut, the base is prepared and the tinning layer is prepared also in the front face of this embedding base through the lead deposit, the die length cast by the pole pillar body will become long, and the mechanical bond strength and the energization engine performance of a bolt or a nut, and a pole pillar body will improve remarkably.
[0020]
[Example] Drawing 1 shows one example of the pole pillar for lead accumulators concerning this invention. The tinning layer 3 is given to the front face of the nut 1 which used copper as the principal component through the lead deposit 2, and the pole pillar for lead accumulators of this example has structure cast by the pole pillar body 4 with which the base of the nut 1 such a lead deposit 2 and with tinning layer 3 uses lead as a principal component. A nut 1 is embedded at the end face, it has base 1a, and the tinning layer 3 is also given to the front face of this embedding base 1a through the lead deposit 2.

[0021] Although the above-mentioned example showed the pole pillar for lead accumulators which cast the nut 1, it is applicable to the pole pillar for lead accumulators which cast the bolt which used copper as the principal component similarly. Also in this case, it embeds at the end face of a bolt, a base is prepared, and the tinning layer is given to the front face of such a bolt with an embedding base through a lead deposit.
[0022] Next, the manufacture approach of such a pole pillar for lead accumulators is explained.
[0023] The lead deposit 2 is formed in the front face of the bolt which used copper as the principal component, or a nut 1 by lead plating (10-30 micrometers) by electrodeposition. Next, the tinning layer 3 is formed by being immersed in the tin which fused the bolt or nut 1 which formed the lead deposit 2 to 380 ****10 which is the temperature more than the leaden melting point (327 **) for 5 - 10 seconds. It casts at the time of casting of the pole pillar body 4 which performs a bolt the obtained lead deposit 2 and with tinning layer 3, or the base of a nut 1 using the molten lead of the temperature more than the melting point (230 **) of tin, and the pole pillar for lead accumulators is obtained.
[0024] Drawing 2 shows the alloy composition diagram of the pole pillar for lead accumulators shown in drawing 1 . Between the lead deposit 2 and the tinning layer 3, the eutectic alloy Pb-Sn layer 5 intervenes like illustration, and the eutectic alloy Pb-Sn layer 6 intervenes between the tinning layer 3 and the pole pillar body 4.
[0025] In this case, in case the eutectic alloy Pb-Sn layer 5 gives the tinning layer 3, it is an eutectic alloy layer made as a result of immersing the lead deposit 2 in the melting tin which raised the temperature of tin more than the leaden melting point (327 **).
[0026] In case the eutectic alloy Pb-Sn layer 6 casts the pole pillar body 4, it is an eutectic alloy layer made as a result of raising leaden temperature more than the melting point (230 **) of tin and casting it.
[0027] By the eutectic alloy Pb-Sn layers 5 and 6 of ********, the adhesion of a bolt or a nut 1, and the pole pillar body 4 improves by leaps and bounds, and the energization engine performance of the pole pillar for lead accumulators improves by leaps and bounds.
[0028] If it embeds at the end face of a bolt or a nut 1, base 1a is prepared and the tinning layer 3 is formed also in the front face of this embedding base 1a through the lead deposit 2 as especially shown in drawing 1 , the die length cast by the pole pillar body 4 will become long, and the mechanical bond strength and the energization engine performance of a bolt or a nut 1, and the pole pillar body 4 will improve remarkably.
[0029] About the adhesion of the bolt or nut 1 in the pole pillar for lead accumulators of this invention which has the eutectic alloy Pb-Sn layers 5 and 6, and the pole pillar body 4, and the energization engine performance of this pole pillar for lead accumulators, when the comparative study with the pole pillar for lead accumulators of structure was performed conventionally, the following results were obtained.
[0030] (1) The comparative study of adhesion (opposite torque test)
The conventional article 900 kg-cm-> this invention article 2700 kg-cm, thus this invention article became distinct [that the value for a torque test is improving about 3 times compared with elegance conventionally].
[0031] In this case, as shown in drawing 3 , the opposite torque test fixes the pole pillar body 4, inserted the torque wrench 7 in the bolt or the nut 1, and performed by measuring with what torque a bolt or a nut 1 would turn.
[0032] (2) Energization performance test (the current of 500A is energized)
The conventional article 45mV(n= 10) -> this invention article 4.0mV (n= 10)
Thus, this invention article became distinct [that the energization engine performance is improving about 10% compared with elegance conventionally].
[0033]
[Effect of the Invention] According to the pole pillar for lead accumulators which starts this invention as explained above, and its manufacture approach, the following outstanding effectiveness can be acquired.

[0034] Since the tinning layer is prepared in the front face of a bolt or a nut through the lead deposit, the adhesion of a bolt or a nut, and a pole pillar body can be raised. For this reason, the energization engine

performance of the pole pillar for lead accumulators can be raised.
[0035] Moreover, since a tinning layer is prepared in the front face of a bolt or a nut through a lead deposit and the eutectic alloy Pb-Sn layer is made to intervene, respectively between a lead deposit and a tinning layer and between a tinning layer and a pole pillar body, the adhesion between a lead deposit and a tinning layer and between a tinning layer and a pole pillar body can be raised by leaps and bounds by existence of these eutectic alloy Pb-Sn layer. For this reason, the energization engine performance of the pole pillar for lead accumulators can be raised by leaps and bounds.
[0036] Moreover, the bolt or nut which gave the lead deposit is immersed into melting tin, and a tinning layer is prepared in the front face of said lead deposit. Since a bolt the obtained lead deposit and with a tinning layer or the base of a nut is cast at the time of casting of the pole pillar body which uses lead as a principal component and the pole pillar for lead accumulators is manufactured The adhesion of a bolt or a nut, and a pole pillar body can be raised by the easy and cheap surface preparation of preparing a tinning layer. In connection with this, the energization engine performance of the pole pillar for lead accumulators can be raised.
[0037] Moreover, the bolt or nut which gave the lead deposit is immersed into the melting tin of the temperature more than the leaden melting point, and a tinning layer is prepared in the front face of said lead deposit. Since it casts at the time of casting of the pole pillar body which performs a bolt the obtained lead deposit and with a tinning layer, or the base of a nut using the molten lead of the temperature more than the melting point of tin and the pole pillar for lead accumulators is manufactured By the easy and cheap surface treatment of preparing a tinning layer, the temperature management at that time, and temperature management at the time of casting of a pole pillar body, the adhesion between a lead deposit and a tinning layer and between a tinning layer and a pole pillar body can be raised by leaps and bounds. In connection with this, the energization engine performance of the pole pillar for lead accumulators can be raised by leaps and bounds.

[Translation done.]